

April 3, 2024

ADDENDUM NO. 2

RE: Item #6, April 4, 2024 Letting - IM 0020(205), PCN 07CV, Minnehaha County - Approach Slab Repair, Polymer Chip Seal, Crash Wall

TO WHOM IT MAY CONCERN:

The following addenda to the plans shall be inserted and made a part of your proposal for the referenced project.

SPECIAL PROVISIONS: Please remove the Index of Special Provisions and replace with attached Index of Special Provisions revised 4/2/24. "Special Provision for High Friction Surface Treatment" dated 4/2/24 was added.

Please add the Special Provision for High Friction Surface Treatment" dated 4/2/24 after the "Special Provision for Contract Time", dated 3/4/24.

SDEBS BID PROPOSAL: *The electronic bid proposal for this contract has been revised to include the changes associated with this addendum. Bidders must log in to the SDEBS to retrieve and incorporate these changes into their bid.*

Bid Items were added:

Bid Item 900E1256 "Abrasive Blasting of PCC Pavement"

Quantities for Bid Items were changed:

Bid Item 480E0100 "Reinforcing Steel" changed from 18,562 to 14,362 Lb

PLANS: Please destroy sheets 2, 3, 33, 48, 88, 90-94, & 109 and replace with the enclosed sheets, dated 3-28-24 & 4-3-24.

Sheet 2: Section F – Surfacing

Bid Items were added:

Bid Item 900E1256 "Abrasive Blasting of PCC Pavement"

Sheet3: Section E – Structure 50-216-220

Quantities for Bid Items were changed:

Bid Item 480E0100 "Reinforcing Steel" changed from 18,562 to 14,362 Lb

Sheets 33 & 48: BRIDGE DECK GRINDING note was revised.

Sheet 88: GENERAL CONSTRUCTION NOTES were revised. Note 6 was added.
BRIDGE DECK GRINDING note 2 was revised.
CLASS B COMMERCIAL TEXTURE FINISH note was added.

Sheets 90-94: REINFORCING SCHEDULE and ESTIMATE QUANTITIES table were revised. F11,
F17, F23, F29 & F35 bar size and Reinforcing Steel quantity were revised.

Sheet 109: Table of Quantities was revised. The quantity for Abrasive Blasting of PCC Pavement
was removed from the project with Addendum No. 1 and should not have.

Sincerely,

Sam Weisgram
Engineering Supervisor

SW/cj

CC: Travis Dressen, Mitchell Region Engineer
Harry Johnston, Sioux Falls Area Engineer

REV 4/2/24

INDEX OF SPECIAL PROVISIONS

PROJECT NUMBER(S): IM 0020(205) PCN: 07CV

TYPE OF WORK: REGIONWIDE APPROACH SLAB REPAIR, POLYMER CHIP SEAL,
CRASH WALL

COUNTY: MINNEHAHA

The following clauses have been prepared subsequent to the Standard Specifications for Roads and Bridges and refer only to the above described improvement, for which the following Proposal is made.

The Contractor's attention is directed to the need for securing from the Department of Environment & Natural Resources, Foss Building, Pierre, South Dakota, permission to remove water from public sources (lakes, rivers, streams, etc.). The Contractor should make his request as early as possible after receiving his contract, and insofar as possible at least 30 days prior to the date that the water is to be used.

Sara Garbe is the official in charge of the Sioux Falls Career Center for Minnehaha County.

THE FOLLOWING ITEMS ARE INCLUDED IN THIS PROPOSAL FORM:

Special Provision for Contract Time, dated 3/4/24.

Special Provision for High Friction Surface Treatment, dated 4/2/24.

Special Provision for Prosecution and Progress, dated 1/21/21.

Special Provision Regarding Railroad Insurance Requirements and Working on Railroad Property for Grade Separated Crossings with BNSF Railway Company, dated 3/7/24.
NOTE: The Contractor WILL NOT be granted permission to proceed with any work on Railroad Right-of-Way until he has been notified by the Railroad that the insurance has been approved and the insurances and certificates has been provided to the SDDOT area office.

Exhibit "C"

Exhibit "C-1"

Special Provision for Acknowledgment and Certification Regarding Article 3, Section 12 of the South Dakota Constitution, dated 8/24/23.

Special Provision for Buy America, dated 12/6/23.

Special Provision for Liability Insurance, dated 4/21/22.

Special Provision for Responsibility for Damage Claims, dated 4/21/22.

Special Provision for Restriction of Boycott of Israel, dated 1/31/20.

Special Provision for Contractor Administered Preconstruction Meeting, dated 12/18/19.
Fuel Adjustment Affidavit, DOT form 208 dated 7/15.
Standard Title VI Assurance, dated 3/1/16.
Special Provision For Disadvantaged Business Enterprise, dated 2/9/24.
Special Provision For EEO Affirmative Action Requirements on Federal and Federal-Aid
Construction Contracts, dated 2/5/24.
Special Provision For Required Contract Provisions Federal-Aid Construction Contracts, Form
FHWA 1273 (Rev. October 23, 2023), dated 10/18/23.
Required Contract Provisions Federal-Aid Construction Contracts, Form
FHWA 1273 (Rev. 10/23/23).
Special Provision Regarding Minimum Wage on Federal-Aid Projects, dated 10/24/19.
Wage and Hour Division US Department of Labor Washington DC. - US Dept. of Labor Decision
Number SD20230032, dated 3/10/23.
Special Provision for Supplemental Specifications to 2015 Standard Specifications for
Roads and Bridges, dated 9/7/22.
Special Provision for Price Schedule for Miscellaneous Items, dated 12/6/23.

**STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION**

**SPECIAL PROVISION
FOR
HIGH FRICTION SURFACE TREATMENT**

**PROJECT IM 0020(205); PCN 07CV
MINNEHAHA COUNTY**

APRIL 2, 2024

I. DESCRIPTION

This work consists of construction of a High Friction Surface Treatment (HFST) using calcined bauxite aggregate bound with an epoxy resin binder.

II. MATERIALS

A. Epoxy Resin Binder: The epoxy resin binder will consist of a two-part resin binder/compound which holds the calcined bauxite aggregate firmly in position. The epoxy resin binder will conform to the requirements of Table 1. The epoxy resin binder will be certified to meet the requirements of Table 1. The certification will contain test results dated no more than 2 years prior to the anticipated application season from an accredited laboratory for the properties listed in Table 1 meeting the applicable requirements. The Contractor will submit the certification for approval by the Engineer and the Manufacturer's recommended mixing ratio a minimum of 14 days prior to beginning the test section.

Table 1

Physical Requirements for Low Modulus Epoxy		
Property	Requirements	Test Method
Viscosity	1500-3000 Centipoise*	ASTM D2556-11 Spindle and speed selection based on ASTM D2556-11
Gel Time	10 minutes minimum	ASTM C881/M 235
Compressive Modulus 7 days	130,000 psi max	ASTM D695
Compressive Strength 24 hours	3,000 psi min	ASTM C579 Test Method B
Tensile Strength 7days	2,000-5,000 psi	ASTM C881/M 235
Tensile Elongation	40% min	ASTM C881/M 235
Absorption	1.0% max	ASTM C881/M 235
Type D Hardness	60-80	ASTM D2240 Cure specimen for 7 days± 6 hours
Thermal Compatibility	PASS	ASTM C884

*Epoxies with low viscosities may be unsuitable for some heated mechanical applications.

B. Calcined Bauxite Aggregate: The material will be clean, dry, free from foreign matter, and conform to the requirements in Table 2. The Contractor will deliver the calcined bauxite aggregate to the construction site in clearly labeled sealed containers. The calcined bauxite aggregate will be certified to meet the requirements of Table 2. The certification will contain the test results dated no more than 2 years prior to the anticipated application season from an accredited laboratory for the properties listed in Table 2. The Contractor will submit the certification for approval by the Engineer a minimum of 14 days prior to beginning the test section.

Table 2

Calcined Bauxite Aggregate Requirements		
Property	Requirements	Test Method
Gradation	100.0% Passing #4 95.0% - 100.0% Passing #6 0.0% - 5.0% Passing #16 0.0% - 0.2% Passing #30	AASHTO T 27
Moisture Content	0.2% Maximum	AASHTO T 255
Aluminum Oxide	87% Minimum	ASTM C25
Resistance to Degradation	20% Maximum	AASHTO T 96

III. CONSTRUCTION REQUIREMENTS

A. General:

1. **Quality Control (QC) Plan:** The Contractor will submit a QC plan to the Engineer for approval at least 14 days prior to the placement of the HFST. The QC plan will show proposed methods to control the equipment, materials, mixing, and placement operations to ensure conformance with these specifications. The Contractor will discuss the QC plan at the preconstruction meeting and as requested by the Engineer.

At a minimum, the QC plan will contain the following:

- a. Key Personnel and Contact Information.
 - 1) The QC plan will designate a plan administrator, who will have full authority to institute any action necessary for the successful operation of the plan. The plan administrator will be available on the jobsite within one hour after being notified of a concern.
 - 2) A field technician will be present at the job site unless otherwise approved in the QC plan. The technician will be responsible for the required field quality control sampling and testing in conformance with the approved QC plan and contract documents. The Contractor will maintain and make available upon request complete records of sampling, testing, actions taken to correct problems, and quality control inspection results. Any deviation from the approved QC plan, without Engineer approval, will be cause for immediate suspension of operations.
- b. Epoxy resin binder production plants, locations of plant, personnel qualifications, inspection and record keeping methods, equipment calibration records, accreditation certificates, and minimum frequencies of sampling and testing per Table 1.
- c. Calcined Bauxite aggregate production plant locations, personnel qualifications, inspection and record keeping methods, equipment calibration records, accreditation certificates, and minimum frequencies of sampling and testing per Table 2.
- d. Calcined Bauxite aggregate storage and moisture control methods.
- e. Cleaning and maintenance procedures and schedule for mixing and application equipment. The cleaning and maintenance procedures and schedule will contain the equipment manufacturer's recommendations for maximum allowable time the epoxy resin binder may remain in the

application equipment before cleaning of the mixer and application system is required.

- f. Corrective actions that will be taken for unsatisfactory construction practices.
2. **Weather Limitations:** The Contractor will not apply the epoxy resin binder material on wet surfaces (including condensation moisture from construction vehicles in front binder application), when the ambient air and pavement surface temperature is less than 55°F or above 105°F, or when the anticipated weather conditions or pavement surface temperature would prevent the proper application of the surface treatment in accordance with the manufacturer's recommendations.
 3. **Seasonal Limitations:** HFST will only be applied within the seasonal limitation of May 1 to October 15 (inclusive).
 4. **Manufacturer's Representative:** A manufacturer's representative must be present on the jobsite for a minimum of the first two full production days of HFST application.

The manufacturer's representative will provide the Engineer and the Contractor with a copy of the written recommendations, technical data sheet, and product safety data sheet. In addition, the Contractor will make a product safety data sheet available to anyone who will be exposed to the epoxy resin binder materials.

5. **Fully-Automated Continuous Application:** The contractor will apply the epoxy resin binder by a truck or trailer mounted application machine that continually mixes, meters, monitors, and delivers the binder components on demand in varying widths up to 12 feet wide at a minimum uniform thickness of 60 mils. Squeegee application of the epoxy resin will not be permitted except as specified for hand applications in accordance with Section III.A.6. The application equipment must utilize continuous pumping and proportioning devices that blends the binder components within a controlled system per the manufacturer's specifications (+/- 2% by volume). The epoxy resin binder must be continuously applied once blended. The application equipment must have an independent recirculating heating system capable of heating the epoxy resin binder per manufacturer's specifications.

The continuous application equipment will utilize an aggregate distribution system capable of mechanically placing aggregate at an application rate of 13 lbs./SY, within 30 seconds of the epoxy resin binder, and from a maximum height of 12 inches into the wet epoxy resin binder evenly across the full width of the installation. Hand application of the aggregate will only be allowed in accordance with Section III.A.6. No exposed "wet" spots of

the epoxy resin binder will be visible once the aggregate is installed. The Contractor will ensure no seams are visible in the middle of the traffic lanes of the finished work after application of the HFST calcined bauxite aggregate.

The Contractor will not allow the mixed epoxy resin binder to separate, cure, dry, be exposed, or harden which may impair retention and bonding of the calcined bauxite aggregate.

The application equipment must be equipped with a built-in data management unit producing real time data providing the following information to the Engineer:

1. The volume of mixed epoxy resin binder per SY being applied
2. The rate of aggregate being applied in lbs./SY
3. The mixed epoxy resin binder mil thickness on average throughout the application width per SY
4. The ambient air and pavement surface temperature during the application period

- 6. Hand Application:** Hand application may be used for areas less than 300 yd². For hand applications, the Contractor will mix the epoxy resin binder components to the correct proportion within 4% by weight using a low speed high torque drill fitted with a helical stirrer. The Contractor will mechanically spray or squeegee the polymeric resin binder over the application surface area. The Contractor will use spiked shoes for all walking, standing, or any other form of foot contact with the polymeric resin binder prior to the application of the calcined bauxite aggregate. The Contractor will apply the epoxy resin binder in the number of layers (minimum of one) recommended by the manufacturer. The application rates of the polymeric resin binder in the various layers shall be as recommended by the manufacturer in order to achieve an average application thickness of 60 mils on the surface.

The Contractor will sprinkle or vertically drop the calcined bauxite aggregate resulting in a minimum coverage rate of 13 lbs./yd² without splashing or disrupting the leveling of the “wet” epoxy resin binder during placement, whether by mechanical or manual means.

- 7. Test Section:** The Contractor will construct a test section (minimum of 200 yd², maximum of 500 yd²) at a self-determined location to demonstrate equipment has been properly calibrated a minimum of 24 hours prior to beginning the project, unless a shorter time period is approved and the finished surface is satisfactory to the Engineer. If the project site is used for the test section, the Contractor will open the test section to traffic after curing has completed, and no uncovered epoxy resin binder remains exposed. The Contractor will correct deficient areas before opening to traffic as directed by the Engineer at no additional cost. At the completion of the

test section, the Contractor will demonstrate the application equipment cleaning procedures.

B. Portland Cement Concrete Pavement and Bridge Approach Slab Preparation and HFST Application:

- 1. Preparation:** Surfaces must be clean, dry, and free of all dust, oil, debris and any other material that might interfere with the bond between the epoxy resin binder material and existing surfaces. Adequate cleaning of all surfaces will be determined by the Engineer. The Contractor will remove pavement markers and delineation within the area to receive HFST prior to placing epoxy resin binder.

The Contractor will prepare the surface receiving a HFST in accordance with the following.

- a. Abrasive Blasting of PCC Pavement:** The entire surface will be thoroughly shot blasted to approximately an International Concrete Repair Institute (ICRI) concrete surface profile CSP-5 (medium shot blast) to remove all foreign materials which may interfere with the bonding or curing of the HFST. The shot blasting will remove all surface laitance and will expose the coarse aggregate to the satisfaction of the Engineer. Small areas where shot blasting is unable to be performed (curb lines, etc.) will be cleaned by abrasive blast cleaning to the satisfaction of the Engineer.

Upon completion of the shot blasting and abrasive blasting, the entire surface will be blown clean with dry compressed air to remove all dust and debris.

Cleaning by shot blasting, abrasive blasting, and compressed air will be done no more than 24 hours prior to the placement of the HFST. In the event the HFST is not placed within 24 hours of shot blasting and abrasive blast cleaning or in the event of rain or other inclement weather contaminating the surface, the surface will be re-cleaned by abrasive blast cleaning and dry compressed air.

Only equipment required for the application of the HFST will be allowed on any portion of the surface which has been cleaned and prepared for application of the HFST. If equipment is used on the cleaned and prepared surface, the area will be protected from contamination with plastic.

Surfaces may need to be washed with a mild detergent, rinsed, and dried using a hot compressed air lance.

- 2. HFST Application:** The Contractor will apply the HFST on Portland cement concrete pavements and bridge approach slabs in accordance with the following.
- a. Epoxy Resin Binder Application Requirements:** The Contractor will apply the two-part modified epoxy resin binder onto the surface to be treated within the temperature range specified and in accordance with Section III.A.5. of this special provision.
 - b. Calcined Bauxite Aggregate Application Requirements:** The Contractor will apply the calcined bauxite aggregate in accordance with Section III.A.5. of this special provision.
 - c. Curing and Clean Up:** The Contractor will allow the HFST to cure in accordance with the epoxy resin binder manufacturer's recommendations (3 hours maximum at an ambient air temperature of at least 75°F). The Contractor will clean up the HFST by removing the excess calcined bauxite aggregate on the treated area and adjacent areas with raveled calcined bauxite aggregate. The Contractor will perform the clean-up prior to opening the section to traffic. The Contractor may reuse excess HFST calcined bauxite aggregate. In order to reuse the reclaimed excess HFST calcined bauxite aggregate, the Contractor must reclaim the excess HFST calcined bauxite aggregate with a mechanical sweeper. The recovered calcined bauxite aggregate must be clean, uncontaminated, and dry. The Contractor will perform street sweeping before placing pavement markings. Temporary or permanent pavement markings must be in place prior to opening lanes to traffic. At least 3 days but not more than 5 days following opening the application area to through traffic, the Contractor will perform additional clean-up of the application area to remove all aggregate shed from the application site by traffic. The Contractor will perform this clean up by sweeping the surface with equipment meeting the requirements of Section 4.5 of the specifications.
- A. Field Acceptance Testing:** The Contractor will ensure the coverage rate of the retained calcined bauxite aggregate is a minimum of 13 lbs./yd². The Contractor will remove and reapply HFST where any patches of exposed epoxy resin binder exist, at no additional cost. The Contractor will perform testing in accordance with Table 3 between 60 and 90 days after installation.

Table 3

Field Acceptance Testing Requirements			
Property	Requirements	Frequency	Test Method
FN40R (Corrected field FN by adding the correction in Table 4)	65 Minimum	Every 0.1 mile in each lane. Location determined by SDDOT	ASTM E274 using a ribbed tire

Table 4

HFST Speed Correction Factors for ASTM E274 Testing					
Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction	Test Speed (mph)	FN Correction
20	-9.3	30	-4.8	40	0.0
21	-8.9	31	-4.4	41	0.5
22	-8.4	32	-3.9	42	1.0
23	-8.0	33	-3.4	43	1.5
24	-7.6	34	-2.9	44	2.0
25	-7.1	35	-2.5	45	2.5
26	-6.7	36	-2.0	46	3.1
27	-6.2	37	-1.5	47	3.6
28	-5.8	38	-1.0	48	4.1
29	-5.3	39	-0.5	49	4.6

The maximum aggregate moisture at the time of application will not exceed 0.5%. The Department will sample the aggregate and perform the aggregate moisture testing in accordance with SD 108 at a minimum frequency of 1 per day.

II. METHOD OF MEASUREMENT

A. Abrasive Blasting of PCC Pavement: Measurement will not be made for abrasive blasting of PCC pavement. The plan quantity will be the basis of payment.

B. High Friction Surface Treatment: Measurement will not be made for high friction surface treatment. The plan quantity will be the basis of payment unless additional application areas are ordered by the Engineer. No deductions will be made for the areas occupied by manholes, inlets, drainage structures, pavement markings, or by any public utility appurtenances within the area.

III. BASIS OF PAYMENT

A. Abrasive Blasting of PCC Pavement: Abrasive blasting of PCC pavement will be paid for at the contract unit price per square yard. Payment will be full

compensation for all labor, equipment, materials, and all incidental work required to shot blast and abrasive blast clean the PCC pavement surface of all foreign materials and to remove and dispose of all residue.

B. High Friction Surface Treatment: High friction surface treatment will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, materials, and all incidental work required to furnish and install the high friction surface treatment including all testing and to remove and dispose of excess calcined bauxite aggregate.

* * * * *

ESTIMATE OF QUANTITIES

Revised 4/3/2024

Section F - Surfacing

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
009E4200	Construction Schedule, Category II	Lump Sum	LS
110E0700	Remove 3 Cable Guardrail	1,464	Ft
110E0730	Remove Beam Guardrail	175.0	Ft
110E0800	Remove W Beam Guardrail End Terminal	4	Each
110E1010	Remove Asphalt Concrete Pavement	305.0	SqYd
110E1100	Remove Concrete Pavement	512.0	SqYd
110E6410	Remove Type 1 MGS for Reset	75.0	Ft
110E6500	Remove Type 1 Guardrail Transition for Reset	2	Each
110E7700	Remove Drop Inlet Frame and Grate Assembly for Reset	4	Each
120E0600	Contractor Furnished Borrow	965	CuYd
260E1010	Base Course	314.0	Ton
260E2010	Gravel Cushion	190.0	Ton
320E1200	Asphalt Concrete Composite	83.7	Ton
380E0090	10" Nonreinforced PCC Pavement	512.0	SqYd
380E6000	Dowel Bar	180	Each
380E6110	Insert Steel Bar in PCC Pavement	144	Each
410E2600	Membrane Sealant Expansion Joint	320.0	Ft
630E0500	Type 1 MGS	1,162.5	Ft
630E1501	Type 1 Retrofit Guardrail Transition	4	Each
630E2018	MGS MASH Tangent End Terminal	4	Each
630E5010	Reset Type 1 MGS	75.0	Ft
630E5301	Reset Type 1 Retrofit Guardrail Transition	2	Each
632E2220	Guardrail Delineator	30	Each
633E3000	Durable Pavement Marking, 4" White	1,589	Ft
633E3005	Durable Pavement Marking, 4" Yellow	1,550	Ft
633E5100	Grooving for Durable Pavement Marking, 4"	3,139	Ft
633E6005	Pavement Marking Masking, 5"	4,108	Ft
634E0110	Traffic Control Signs	1,093.7	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Board	2	Each
634E0525	Linear Delineation System Panel, Barrier Mounted	221	Each
634E0600	4" Temporary Pavement Marking Tape Type I	4,108	Ft
634E0700	Traffic Control Movable Concrete Barrier	221	Each
634E0705	Remove and Reset Traffic Control Movable Concrete Barrier	221	Each
634E0750	Temporary Concrete Barrier End Protection	4	Each
634E0755	Remove and Reset Temporary Concrete Barrier End Protection	6	Each
634E1215	Contractor Furnished Portable Changeable Message Sign	2	Each
634E1255	Contractor Furnished Speed Monitoring Radar Trailer	2	Each
670E7000	Reset Drop Inlet Frame and Grate Assembly	4	Each
734E0010	Erosion Control	Lump Sum	LS
900E1250	High Friction Surface Treatment	465.0	SqYd
900E1256	Abrasive Blasting of PCC Pavement	465.0	SqYd

Section F - Surfacing

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
900E1310	Concrete Washout Facility	1	Each
998E0100	Railroad Protective Insurance	Lump Sum	LS

Section E - Structure 50-217-217

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	328.8	SqYd
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
430E0300	Granular Bridge End Backfill	14.6	CuYd
460E0150	Concrete Approach Slab for Bridge	261.3	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.5	SqYd
480E0504	No. 4 Rebar Splice	38	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	60	Each
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	1,255.8	SqYd
491E0110	Abrasive Blasting of Bridge Deck	1,255.8	SqYd
491E0120	Bridge Deck Grinding	1,255.8	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	26.4	CuFt



SPECIFICATIONS
Standard Specifications for Roads and Bridges, 2015 Edition
and Required Provisions, Supplemental Specifications and
Special Provisions as included in the Proposal.

ESTIMATE OF QUANTITIES (CONTINUED)

Revised 4/3/2024

Section E - Structure 50-218-217

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0045	Remove Partial Bridge Joint	4	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0174	Concrete Patching Material, Miscellaneous	6.6	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	4.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	4.0	SqYd
491E0120	Bridge Deck Grinding	4.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	26.4	CuFt

Section E - Structure 50-218-219

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0045	Remove Partial Bridge Joint	4	Each
120E3120	Bridge Berm Repair	2	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0174	Concrete Patching Material, Miscellaneous	6.7	CuFt
460E0300	Breakout Structural Concrete	0.3	CuYd
460E0380	Install Dowel in Concrete	3	Each
462E0250	Cellular Grout	4.2	CuYd

Section E - Structure 50-217-219

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E3310	Bridge Elevation Survey	Lump Sum	LS
110E0010	Remove Concrete Bridge Approach Slab	253.6	SqYd
120E3120	Bridge Berm Repair	2	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
430E0300	Granular Bridge End Backfill	10.4	CuYd
460E0150	Concrete Approach Slab for Bridge	186.1	SqYd
460E0160	Concrete Approach Sleeper Slab for Bridge	67.5	SqYd
462E0250	Cellular Grout	4.2	CuYd
480E0504	No. 4 Rebar Splice	28	Each
480E0505	No. 5 Rebar Splice	48	Each
480E0506	No. 6 Rebar Splice	44	Each
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	26.4	CuFt

Section E - Structure 50-216-220

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
420E0100	Structure Excavation, Bridge	164	CuYd
460E0050	Class A45 Concrete, Bridge	91.0	CuYd
460E0380	Install Dowel in Concrete	606	Each
480E0100	Reinforcing Steel	14,362	Lb
491E0005	Two Coat Bridge Deck Polymer Chip Seal	1,397.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	1,397.0	SqYd
491E0120	Bridge Deck Grinding	1,397.0	SqYd



STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-0020(205)	33	135

APPROACH SLABS (continued)

- The top of approach slab elevations will be subject to the approval of the Engineer. Care will be taken to provide a smooth transition from the bridge deck elevations to the new pavement elevations established in the field so as to prevent any dips or bumps in the areas of the bridge ends or ends of the new approach slabs. The maximum rate of grade transition through the approach slab will be 1/8 inch per 10 feet.
- Blockouts will be placed at the armor angle assembly splice and the strip seal splice on both approach slabs as shown in the plans to prevent welding next to concrete.
- Sleeper slab riser will be cast with or later than the approach slab. Care will be taken to ensure the correct grade is maintained across the joint.
- The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor will submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor will submit proposed alternate details for approval.
- The use of an Engineer approved vibratory screed will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the screed will be kept parallel to the screed.
- The concrete in the approach slab will be tined perpendicular to the centerline of the roadway.
- The new approach slabs and sleeper slabs will have a surface finish as specified in Section 460.3 L.4 of the Construction Specifications.
- The quantity Gravel Cushion required to fill any low spots or voids is based on a 2-inch layer under the area of the approach slab. The actual quantity may vary.
- The concrete approach slabs will be cured in accordance with Section 460.3 M of the Construction Specifications. The minimum 7-day cure time requirement will be waived. The approach slabs will be cured until a minimum compressive strength of 4,000 psi is reached.
- Concrete Approach Sleeper Slab for Bridge will be paid for at the contract unit price per square yard. This payment will be full compensation for excavation; furnishing, hauling, and placing all materials including: concrete, embedded angle, concrete anchors, and reinforcing steel; for disposal of all excavated material and surplus materials; labor; tools; equipment; and any incidentals necessary to complete this item of work.
- Any Gravel Cushion, type B drainage fabric, and compaction required to fill any low spots or voids will be paid for at the contract unit price per cubic yard for Granular Bridge End Backfill. This payment will be full compensation for furnishing, hauling, and placing all materials including disposal of all surplus materials; labor; tools; equipment; and any incidentals necessary to complete this item of work.

BRIDGE DECK GRINDING

- The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning will be at no additional cost to the Department.
- The existing bridge deck has a high friction polymer chip seal and pavement marking that will be removed.

TWO COAT BRIDGE DECK POLYMER HIGH FRICTION CHIP SEAL

- The Two Coat Bridge Deck Polymer High Friction Chip Seal shall be furnished and installed in accordance with Section 491 of the Construction Specification except as modified by these notes.
- The polymer shall conform to Type I from the Department's approved products list for Bridge Deck Polymer Chip Seal.
- The calcined bauxite aggregate shall be used in lieu of the aggregate specified in Section 491. Properties of the calcined bauxite aggregate are listed in the High Friction Surface Aggregate notes.
- Measurement will not be made for the Two Coat Bridge Deck Polymer High Friction Chip Seal. The plans quantity will be the basis for payment.
- The Two Coat Bridge Deck Polymer High Friction Chip Seal will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, material, and all incidental work required to furnish and install the Two Coat Bridge Deck Polymer High Friction Chip Seal and to remove and dispose of the excess cover aggregate. Payment will also be full compensation for all manufacturer approved representative expenses.

HIGH FRICTION SURFACE AGGREGATE

The material shall be clean, dry, and free from foreign matter. The Contractor shall deliver the calcined bauxite aggregate to the construction site in clearly labeled containers. The calcined bauxite aggregate shall be certified to meet the requirements of Table 1.

Table 1

Calcined Bauxite Aggregate Requirements		
Property	Requirements	Test Method
Gradation	100.0% Passing #4	AASHTO T 27
	95.0% - 100.0% Passing #6	
	0.0% - 5.0% Passing #16	
Moisture Content	0.2% Maximum	AASHTO T 255
Aluminum Oxide	87% Maximum	ASTM C25
LA Abrasion Test	20% Maximum	AASHTO T 96
	Test sample gradation differs from gradation requirements.	

AS - BUILT ELEVATION SURVEY

The Contractor will be responsible for producing an as-built elevation survey soon after construction is complete and before the bridge is completely open to traffic. The Contractor will be responsible for recording the as-built elevations at the locations shown by the table of as-built elevations shown in the plans. The completed table will be given to the Engineer who will forward a copy to the Bridge Maintenance Engineer in the Office of Bridge Design and the Senior Region Bridge Engineer. The elevations will be based on the control points provided in the plans. The Contractor will be responsible for verifying the control points provided in the plans. All costs associated with obtaining the elevations at the locations shown in the table and for the benchmark shown in the plans, including all equipment, labor and any incidentals required will be incidental to the contract lump sum price for Bridge Elevation Survey.

**NOTES (CONTINUED)
FOR
282' - 6 1/2" PRESTR. GIRDER BRIDGE**

Str. No. 50-217-217

AUGUST 2023

3 OF 16



DESIGNED BY: K.A.	DRAWN BY: R.L.	CHECKED BY: T.A.	BRIDGE ENGINEER
----------------------	-------------------	---------------------	-----------------

ESTIMATE OF STRUCTURE QUANTITIES

Revised 3-28-2024

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-0020(205)	48	135

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
110E0045	Remove Partial Bridge Joint	4.0	Each
410E2600	Membrane Sealant Expansion Joint	83.8	Ft
460E0174	Concrete Patching Material, Miscellaneous	6.6	CuFt
460E0300	Breakout Structural Concrete	0.2	CuYd
491E0007	Two Coat Bridge Deck Polymer High Friction Chip Seal	4.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	4.0	SqYd
491E0120	Bridge Deck Grinding	4.0	SqYd
491E0130	Concrete Removal, Class A	4.0	SqYd
491E0140	Concrete Removal, Class B	4.0	SqYd
491E0172	Concrete Patching Material, Bridge Deck	26.4	CuFt

SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

- All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.
- The elevations shown in the original construction plans are not based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

SCOPE OF WORK & SEQUENCE OF OPERATIONS

All work on this structure will be accomplished with the traffic control shown elsewhere in the plans. Alternate sequence of operations may be submitted by the contractor for approval by the engineer a minimum of two weeks prior to the preconstruction meeting.

- Remove damaged concrete from sleeper slabs and cut out existing expansion joint material for the first phase of construction.
- Complete deck repairs as required prior to placement of Two Coat Bridge Deck Polymer High Friction Chip Seal for phase one.
- Repair sleeper slab hat concrete and place sleeper slab joints with approved Membrane Sealant Expansion Joint for the first phase of construction.
- Place Two Coat Bridge Deck Polymer High Friction Chip Seal for phase one.

- Switch traffic and repeat steps 1 through 4 for the second phase of construction.

GENERAL CONSTRUCTION NOTES

- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.
- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- All lap splices shown are contact lap splices unless noted otherwise.

CONCRETE BREAKOUT

- Locations identified for concrete repair shall have the existing damaged concrete broken out to the limits shown on the plans. Breakout limits shall be defined with a 3/4" deep sawcut (unless specified otherwise in these plans), where practical, as approved by the Engineer. Reinforcing steel that is exposed and is scheduled for use in the new construction shall be cleaned and straightened to the satisfaction of the Engineer. Care shall be taken not to damage the existing reinforcing steel that is to be reused in the new construction during breakout. Any reinforcing steel that is damaged during the concrete breakout shall be replaced or repaired, as approved by the Engineer, by the Contractor at no cost to the Department.
- All broken out concrete and shall be disposed of by the Contractor. Any disposal of discarded material shall be in accordance with the Environmental Commitments.
- During concrete removal operations, no broken out concrete shall be allowed to fall over Southeastern Avenue and Rail Road.

BRIDGE DECK GRINDING

- The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning will be at no additional cost to the Department.
- The existing bridge deck has a high friction polymer chip seal and pavement marking that will be removed.

CONCRETE PATCHING MATERIAL

- In lieu of the 48-hour wet cure, the contractor may use a wax-based curing compound after 4 hours of wet cure. The wax-based curing compound will be white pigmented and will be applied to the patch until the entire surface is white. After the 48-hour cure period, the

curing compound will be completely sand blasted off and the surface of the patch will be allowed to air dry for a minimum of 48 hours before application of the polymer chip seal.

- A thicker layer of the Two Coat Bridge Deck Polymer High Friction Chip Seal will not be used in place of Concrete Patching Material, Bridge Deck. Joint Nosing Material from the Department's Approved Products List may be used for Concrete Patching Material, Bridge Deck provided it is compatible with the polymer used for the chip seal and is approved by the manufacturer's representative. Joint Nosing Material will be fully cured before application of the chip seal. If Joint Nosing Material is substituted for Concrete Patching Material it will be paid for at the contract unit price per cubic foot for Concrete Patching Material, Bridge Deck.

TWO COAT BRIDGE DECK POLYMER HIGH FRICTION CHIP SEAL

- The Two Coat Bridge Deck Polymer High Friction Chip Seal shall be furnished and installed in accordance with Section 491 of the Construction Specification except as modified by these notes.
- The polymer shall conform to Type I from the Department's approved products list for Bridge Deck Polymer Chip Seal.
- The calcined bauxite aggregate shall be used in lieu of the aggregate specified in Section 491. Properties of the calcined bauxite aggregate are listed in the High Friction Surface Aggregate notes.
- Measurement will not be made for the Two Coat Bridge Deck Polymer High Friction Chip Seal. The plans quantity will be the basis for payment.
- The Two Coat Bridge Deck Polymer High Friction Chip Seal will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, equipment, material, and all incidental work required to furnish and install the Two Coat Bridge Deck Polymer High Friction Chip Seal and to remove and dispose of the excess cover aggregate. Payment will also be full compensation for all manufacturer approved representative expenses.



ESTIMATE OF STRUCTURE QUANTITIES & NOTES FOR 282' - 6 1/2" PRESTR. GIRDER BRIDGE

Str. No. 50-218-217

AUGUST 2023

3 OF 16

DESIGNED BY: K.A.	DRAWN BY: R.L.	CHECKED BY: T.A.	BRIDGE ENGINEER
----------------------	-------------------	---------------------	-----------------

ESTIMATE OF STRUCTURE QUANTITIES

Revised - 4-3-2024

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	IM-0020(205)	88	135

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
420E0100	Structure Excavation, Bridge	164.0	CuYd
460E0050	Class A45 Concrete, Bridge	91.0	CuYd
460E0380	Install Dowel in Concrete	606	Each
480E0100	Reinforcing Steel	14,362	Lb
491E0005	Two Coat Bridge Deck Polymer Chip Seal	1,397.0	SqYd
491E0110	Abrasive Blasting of Bridge Deck	1,397.0	SqYd
491E0120	Bridge Deck Grinding	1,397.0	SqYd

SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO Standard Specifications for Highway Bridges 17th Edition using Working Stress Design.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications and Special Provisions as included in the Proposal.

DETAILS AND DIMENSIONS OF EXISTING BRIDGE

- All details and dimensions of the existing bridge, contained in these plans, are based on the original construction plans and shop plans. It is the Contractor's responsibility to inspect and verify the actual field conditions and any necessary as-built dimensions affecting the satisfactory completion of the work required for this project.
- The elevations shown in the original construction plans are not based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

SCOPE OF WORK & SEQUENCE OF OPERATIONS

All work on this structure will be accomplished with the traffic control shown elsewhere in the plans. Alternate sequence of operations may be submitted by the contractor for approval by the engineer a minimum of two weeks prior to the preconstruction meeting.

- Grind deck as required prior to placement of Two Coat Bridge Deck Polymer Chip Seal for phase one.
- Place Two Coat Bridge Deck Polymer Chip Seal for phase one.
- Switch traffic and repeat steps 1 through 2 for the second phase of construction.
- Construct pier protection wall struts as detailed in these plans.

GENERAL CONSTRUCTION NOTES

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise in the plans. Match existing chamfer if the existing chamfer differs.

- Use 2" clear cover on all reinforcing steel except as shown otherwise.
- Request for construction joints or reinforcing steel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of reinforcing steel.
- All lap splices shown are contact lap splices unless noted otherwise.
- Any crushed aggregate slope protection that is disturbed will be restored by the Contractor. Any cost associated will be incidental to the Structure Excavation.
 - The aggregate used in the crushed aggregate slope protection will conform to the requirements of Section 820 of the Construction Specifications for coarse aggregate for Class A Concrete (Size #1).
 - The asphalt material used in the crushed aggregate slope protection will be either Asphalt Type MC-70 or MC-250, or emulsified Asphalt Type RS-1, RS-2, CRS-1, or CRS-2 meeting the requirements of Section 890 of the Construction Specifications and AASHTO M81, AASHTO M140, and AASHTO M208 respectively.

DESIGN MIX OF CONCRETE

Class A45 Concrete will be used for the crash wall struts.

BRIDGE DECK GRINDING

- The Contractor will have the option of grinding the entire deck surface during phase one. Any additional costs incurred for grinding the entire deck surface such as additional traffic control or cleaning will be at no additional cost to the Department.
- The existing bridge deck has tining and pavement markings that will be removed.

TWO COAT BRIDGE DECK POLYMER CHIP SEAL

The polymer will conform to Type I per the Department's Approved Products List for Bridge Deck Polymer Chip Seal.

DOWELS INSTALLED IN CONCRETE

- The epoxy resin mixture shall be of a type of bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881 Type IV, Grade 3). Grade 1, 2 or 3 may be used for vertical dowels, and Grade 3 epoxy will be used for all horizontal dowels.
- The diameter of the drilled holes shall not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per Manufacturer's recommendations. Use compressed air or other techniques to insure that the hole is free of any loose material before epoxy resin is applied.

- Holes drilled in the existing concrete shall be true and normal or as shown in the plans. Care shall be taken not to damage the existing reinforcing steel or spall the bottom of the bridge deck during drilling operations. It is likely that some of the existing reinforcing steel shown in the plans may have been placed out of position during construction. Therefore, prior to the start of drilling any holes, an effort will be made by Department forces to mark on the concrete surface, where practical, any locations of in-place reinforcing steel. In spite of this precaution, the Contractor can still expect to encounter reinforcing steel which will require shifting of the dowel spacing, as approved by the Engineer, to miss the existing reinforcing steel.
- No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.
- Mix the epoxy resin as recommended by the Manufacturer and apply with an injection method as approved by the Engineer. Fill the holes from the bottom up 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel bar. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.
- Embed dowels 7 1/2 inches into the existing concrete.
- The cost of epoxy resin, dowels, drilling, installation and other incidental items shall be incidental to the contract unit price each for Install Dowel in Concrete.

CLASS B COMMERCIAL TEXTURE FINISH

- A Class B commercial texture finish shall be applied to the following areas:
 - Crash Wall Struts (Typical):** all exposed surfaces. Color shall match existing.
- The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
- Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer's recommendations. The commercial texture finish itself does not require a specific cure except for drying.

ESTIMATE OF STRUCTURE QUANTITIES & NOTES FOR 322' - 4 3/4" CONT. COMP. GIRDER BRIDGE

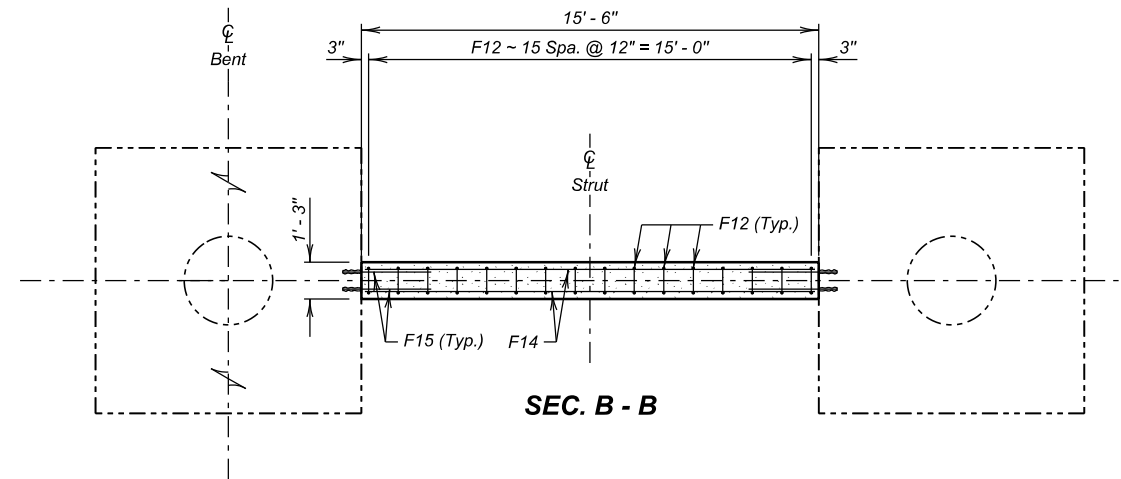
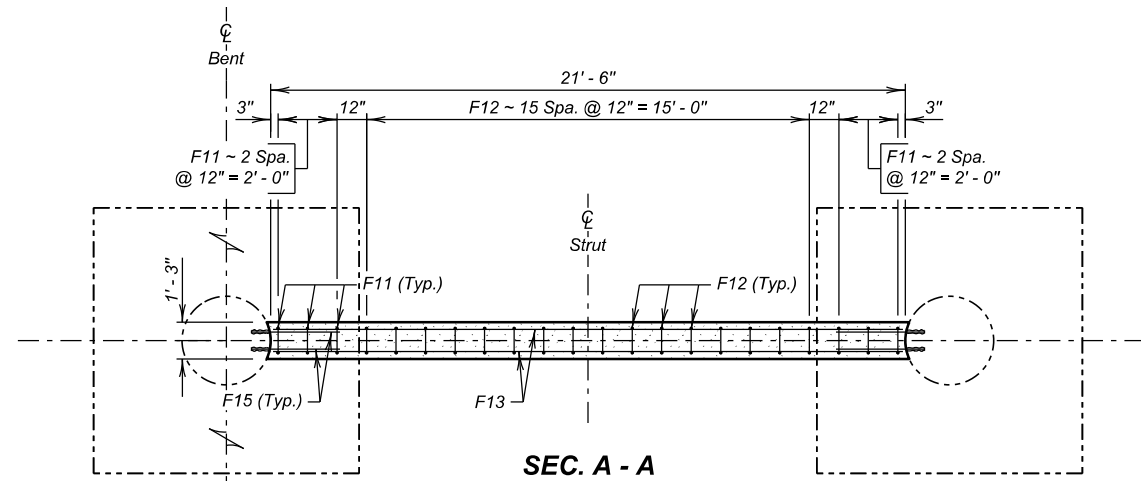
Str. No. 50-216-220

AUGUST 2023

2 OF 17



DESIGNED BY: K.A.	DRAWN BY: R.L.	CHECKED BY: T.A.	BRIDGE ENGINEER
----------------------	-------------------	---------------------	-----------------



REINFORCING SCHEDULE

(For One Bent - Two Struts)

Mk.	No.	Size	Length	Type	Bending Details
F11	24	6	12' - 5"	17	
F12	64	6	13' - 11"	17	
F13	36	6	21' - 2"	Str.	
F14	12	6	15' - 2"	Str.	
F15	88	6	2' - 11"	Str.	
F16	24	10	5' - 0"	Str.	

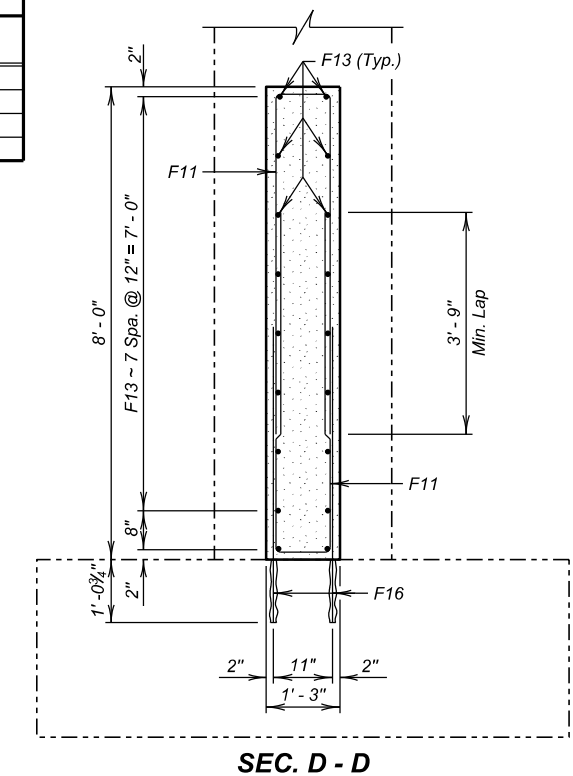
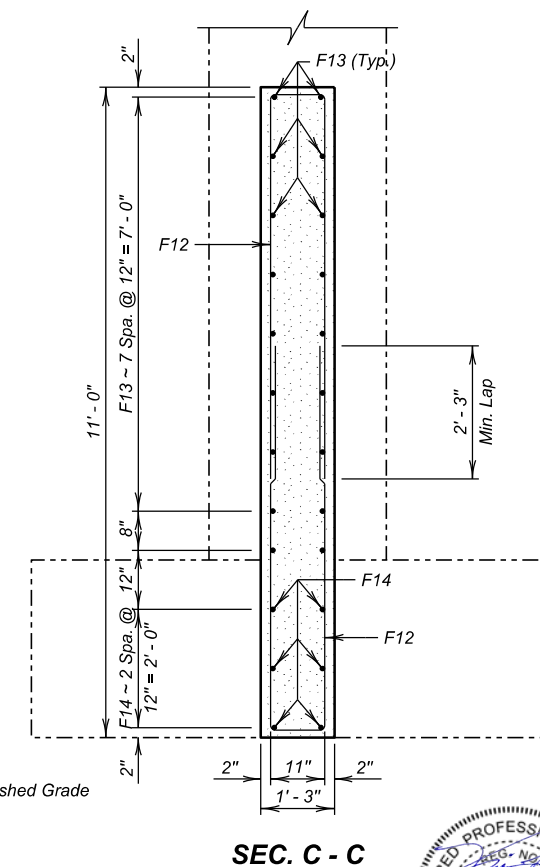
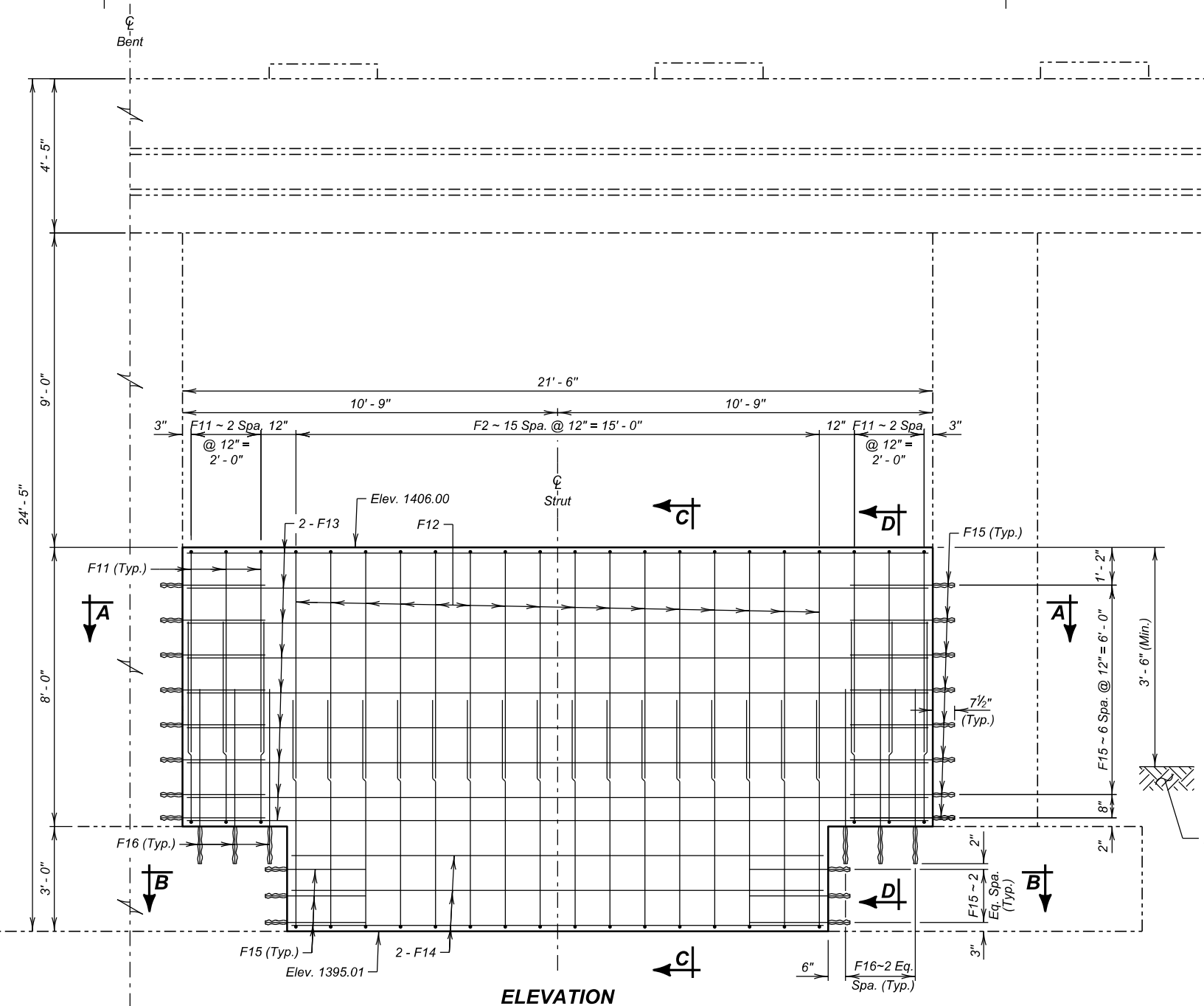
Δ Does not include the following quantities for bars as these are paid for in the Bid Item "Install Dowel in Concrete".

NOTES:
All dimensions are out to out of bars.

ESTIMATE QUANTITIES

(For One Bent - Two Struts)

ITEM	UNIT	QUANTITY
Structure Excavation, Bridge	Cu. Yd.	45
Class A45 Concrete, Bridge	Cu. Yd.	20.2
Install Dowel in Concrete	Each	112
Reinforcing Steel	Lb.	3204



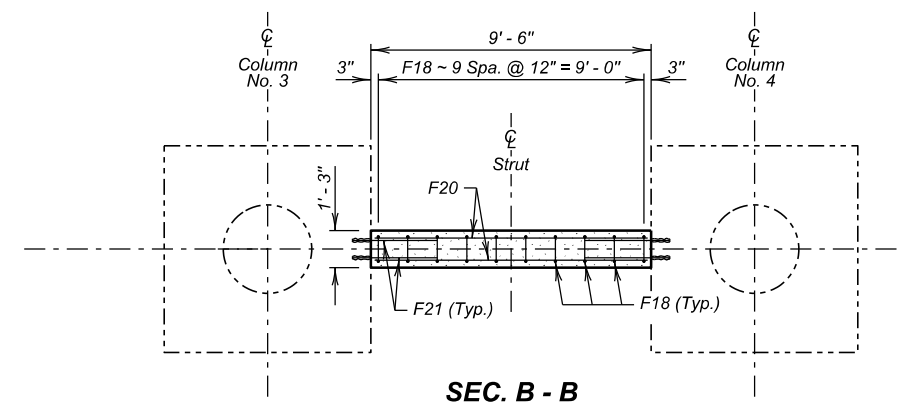
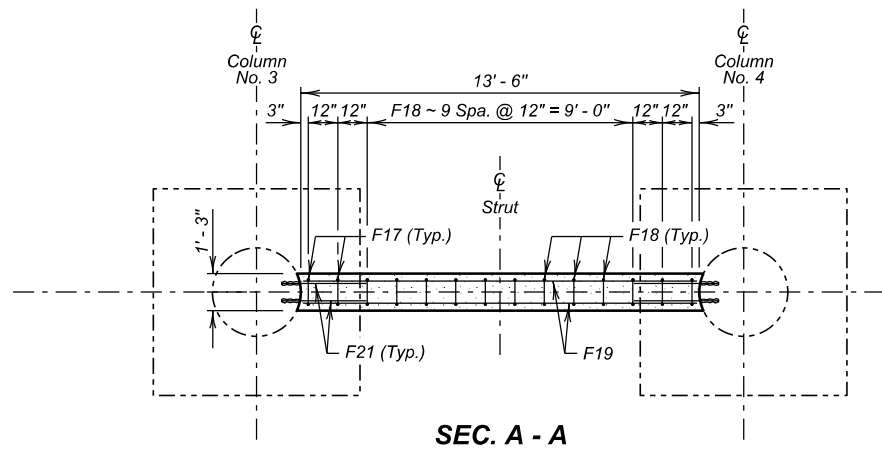
CRASH WALL STRUT (TYPE 'A') BENT NO. 3
FOR
322' - 4 3/4" CONT. COMP. GIRDER BRIDGE
86' - 0" ROADWAY OVER I-229
STR. NO. 50-216-220

33° 33' LHF SKEW
SEC. 22/27-T101N-R49W
IM-0020(205)



MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023

DESIGNED BY K.A.	CK. DES. BY D.S.	DRAFTED BY R.L.	BRIDGE ENGINEER
---------------------	---------------------	--------------------	-----------------



REINFORCING SCHEDULE

(For One Bent - Three Struts)

Mk.	No.	Size	Length	Type	Bending Details
F17	24	6	12'-9"	17	
F18	60	6	13'-9"	17	
F19	54	6	13'-2"	Str.	
F20	18	6	11'-5"	Str.	
F21	120	6	2'-11"	Str.	
F22	24	10	5'-0"	Str.	

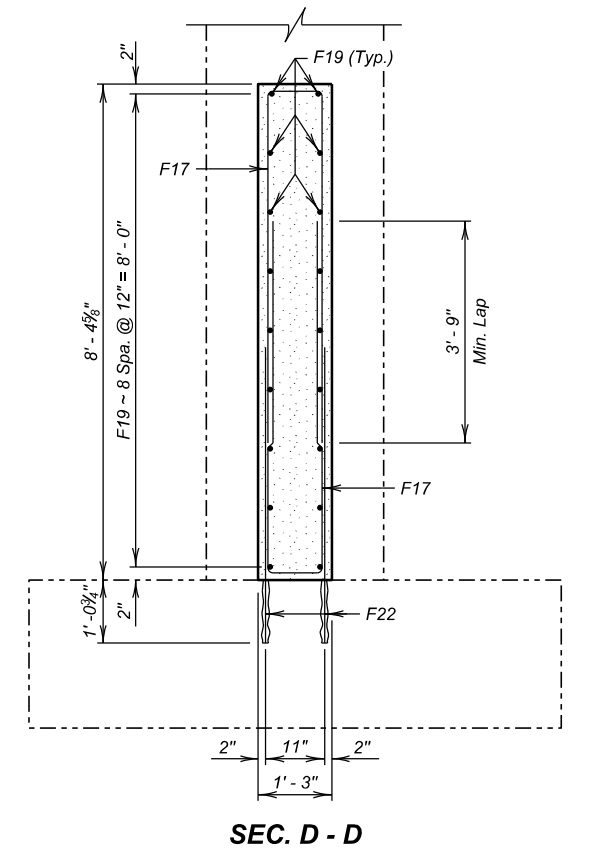
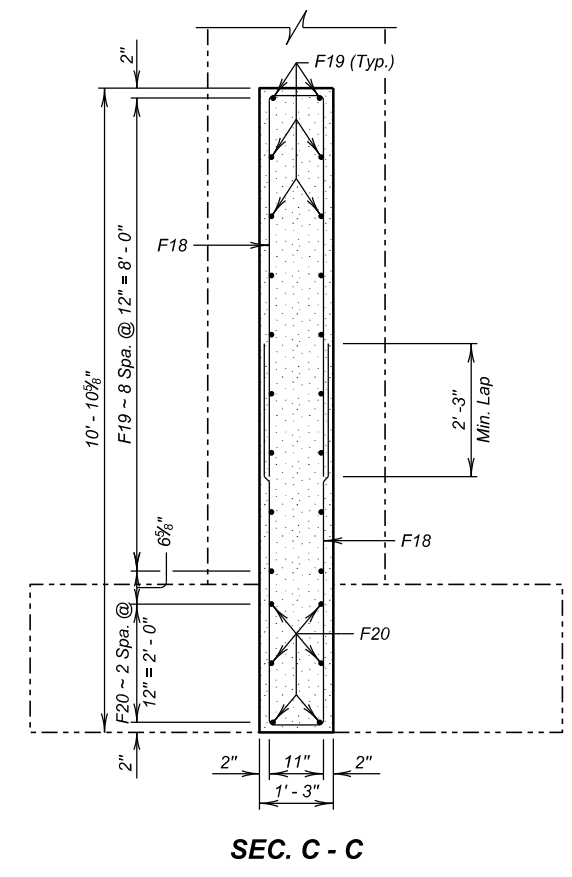
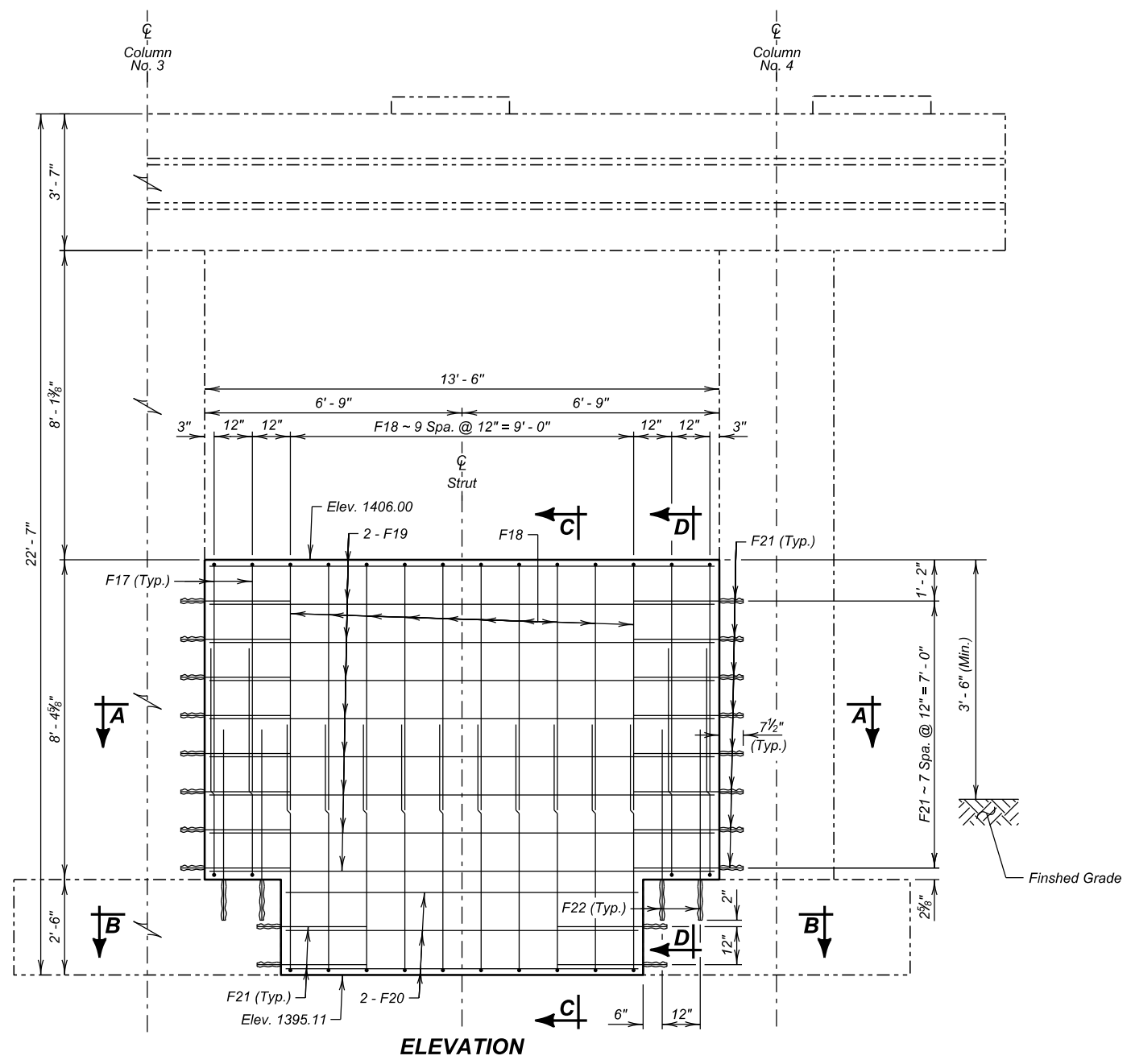
△ Does not include the following quantities for bars as these are paid for in the Bid Item "Install Dowel in Concrete".

NOTES:
All dimensions are out to out of bars.

ESTIMATE QUANTITIES

(For One Bent - Three Struts)

ITEM	UNIT	QUANTITY
Structure Excavation, Bridge	Cu. Yd.	40
Class A45 Concrete, Bridge Repair	Cu. Yd.	19.0
Install Dowel in Concrete	Each	144
Reinforcing Steel	Lb.	3076



CRASH WALL STRUT (TYPE 'B') BENT NO. 3
 FOR
322' - 4 3/4" CONT. COMP. GIRDER BRIDGE
 86' - 0" ROADWAY OVER I-229
 STR. NO. 50-216-220

MINNEHAHA COUNTY
 S. D. DEPT. OF TRANSPORTATION
 AUGUST 2023



REINFORCING SCHEDULE
(For One Bent - Three Struts)

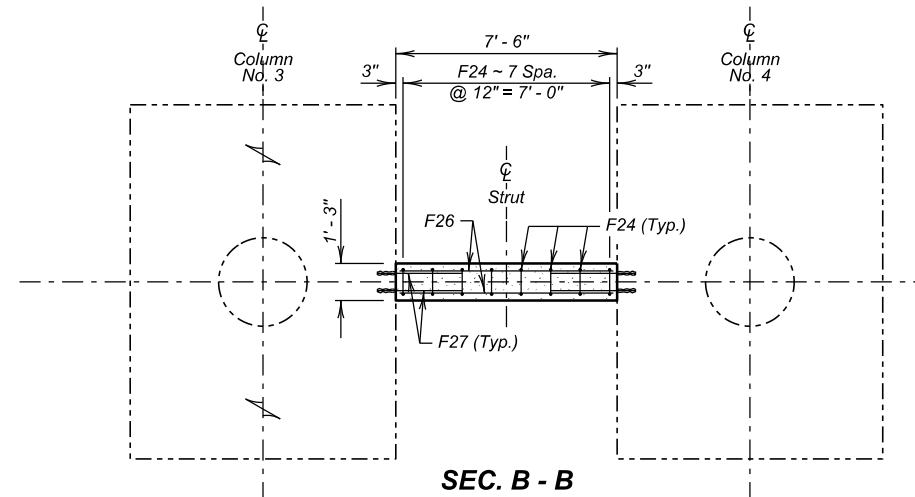
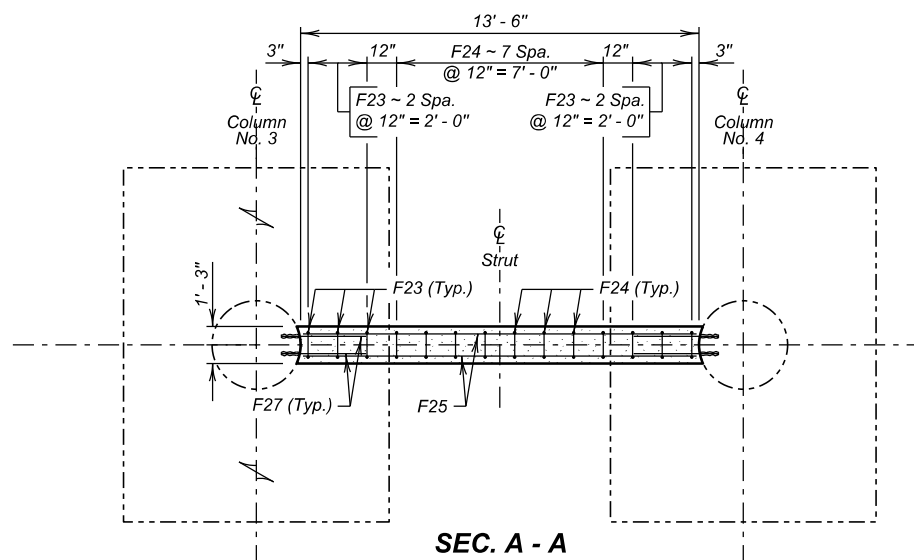
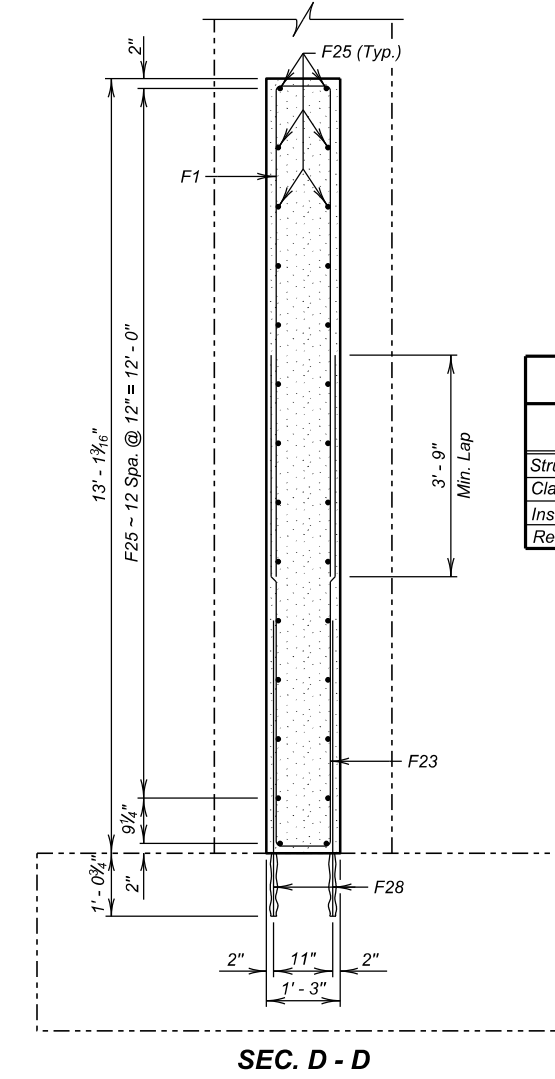
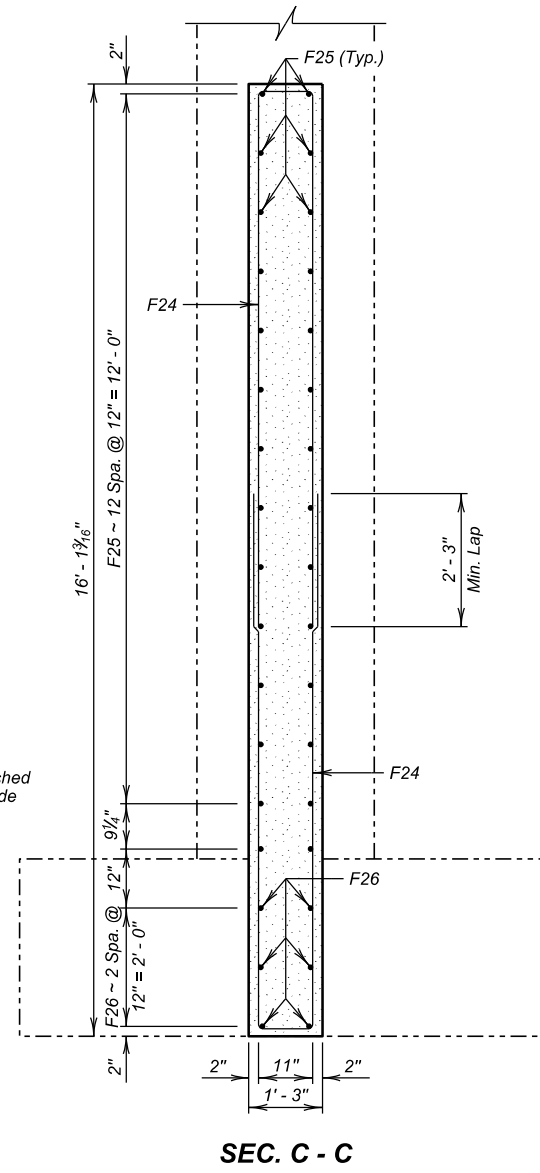
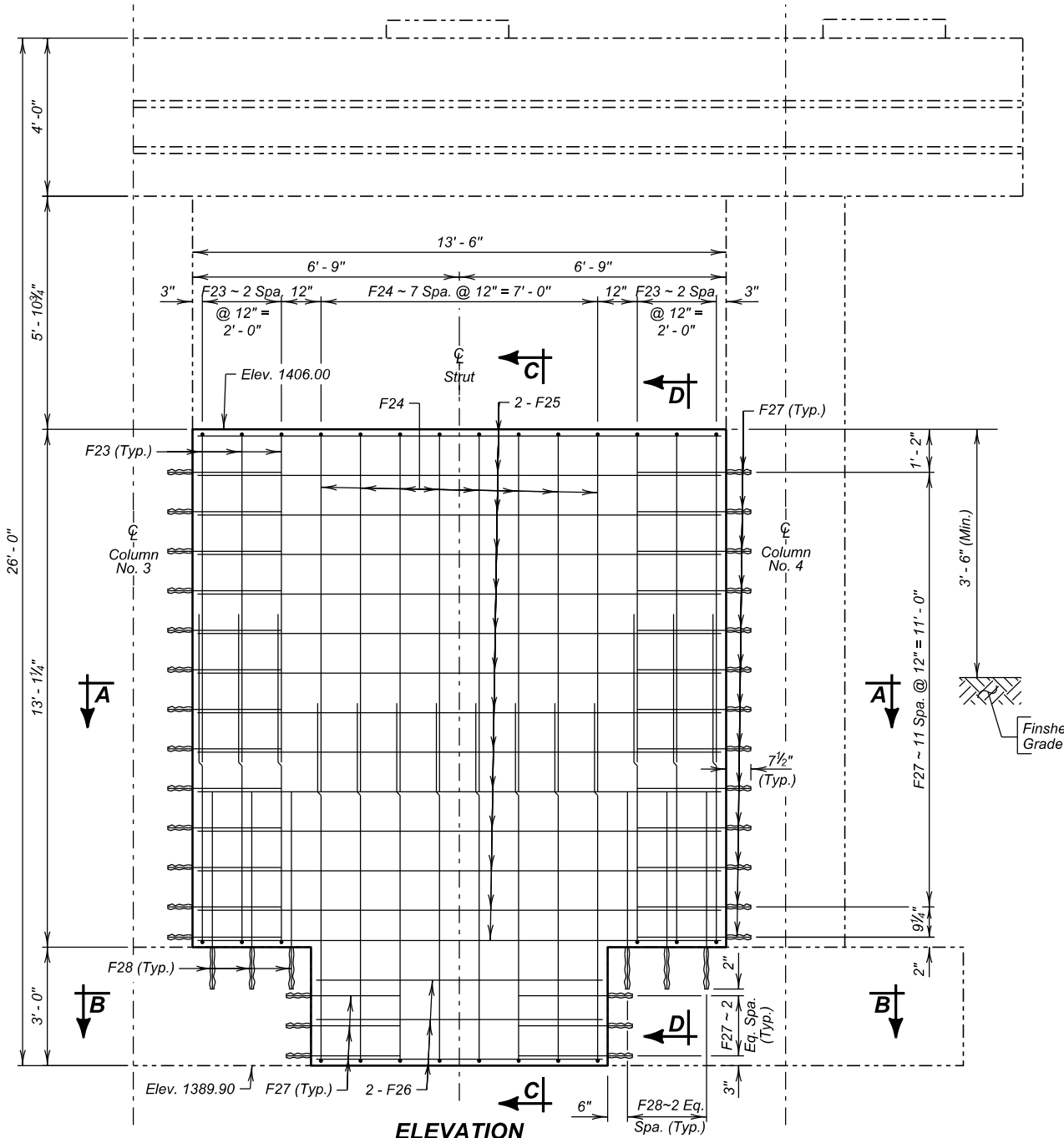
Mk.	No.	Size	Length	Type	Bending Details
F23	36	6	17'-7"	17	
F24	48	6	19'-1"	17	
F25	84	6	13'-2"	Str.	
F26	18	6	11'-5"	Str.	
F27	192	6	2'-11"	Str.	
F28	36	10	5'-0"	Str.	

△ Does not include the following quantities for bars as these are paid for in the Bid Item "Install Dowel in Concrete".

NOTES:
All dimensions are out to out of bars.

ESTIMATE QUANTITIES
(For One Bent - Three Struts)

ITEM	UNIT	QUANTITY
Structure Excavation, Bridge	Cu. Yd.	33
Class A45 Concrete, Bridge Repair	Cu. Yd.	27.7
Install Dowel in Concrete	Each	228
Reinforcing Steel	Lb.	4297

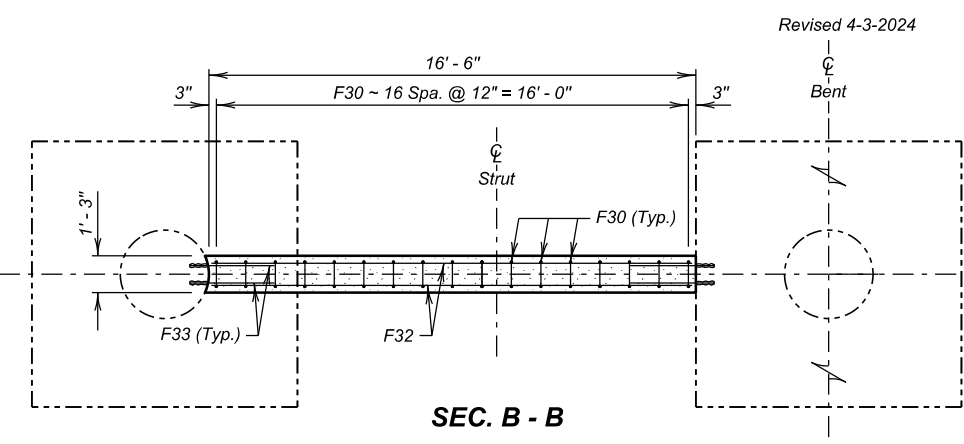
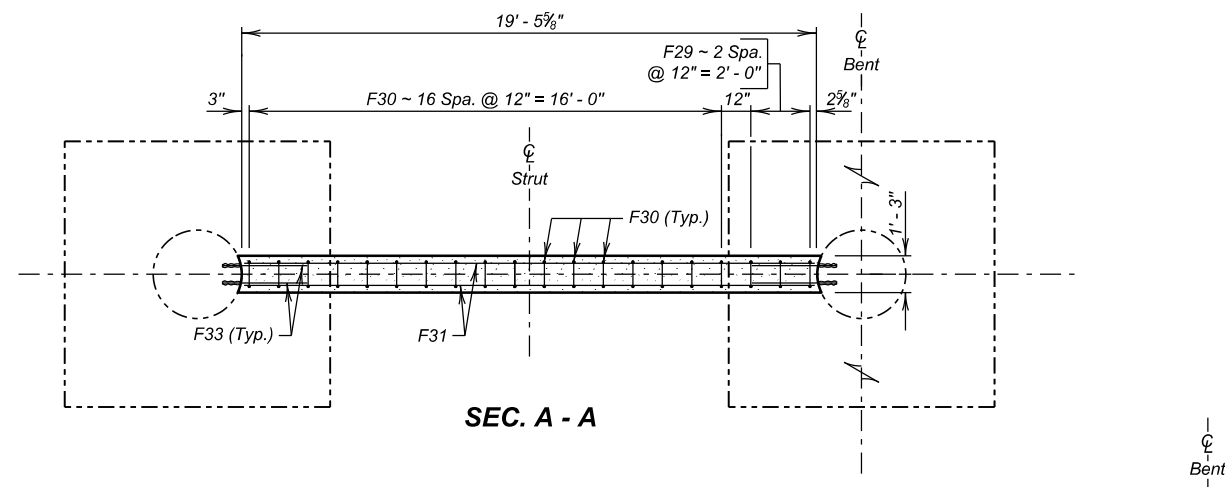


CRASH WALL STRUT (TYPE 'C') BENT NO. 4
FOR
322' - 4 3/4" CONT. COMP. GIRDER BRIDGE
86' - 0" ROADWAY OVER I-229
STR. NO. 50-216-220

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023



Revised 4-3-2024



REINFORCING SCHEDULE
(For One Bent - One Strut)

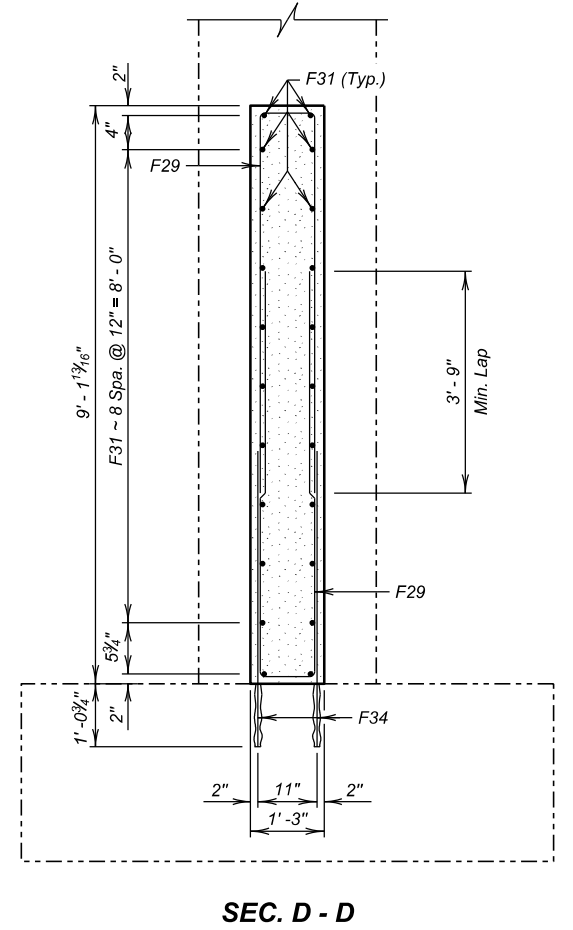
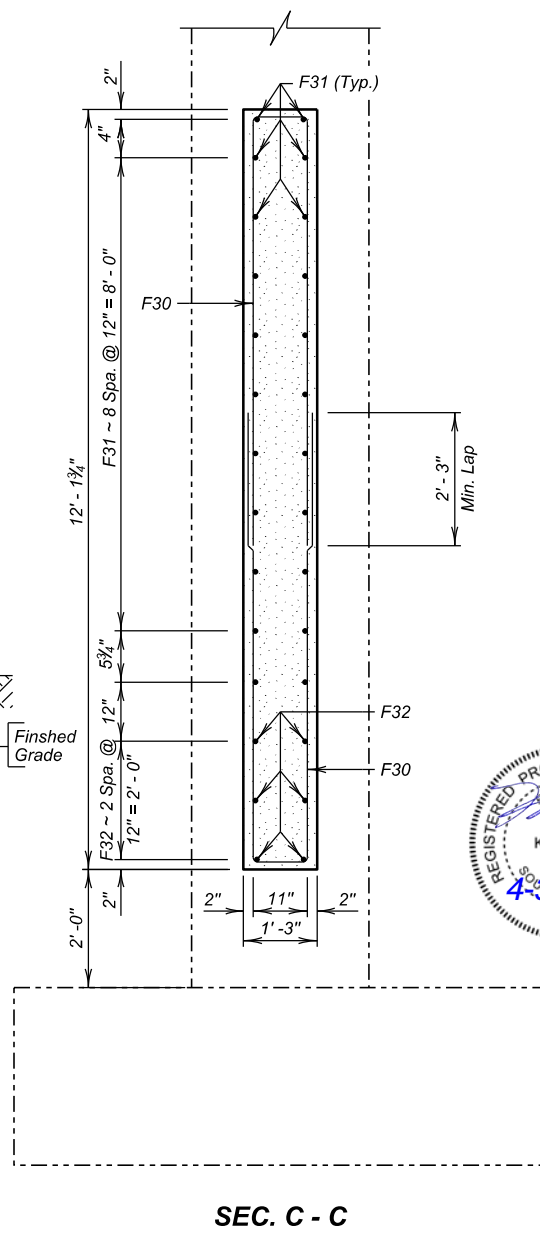
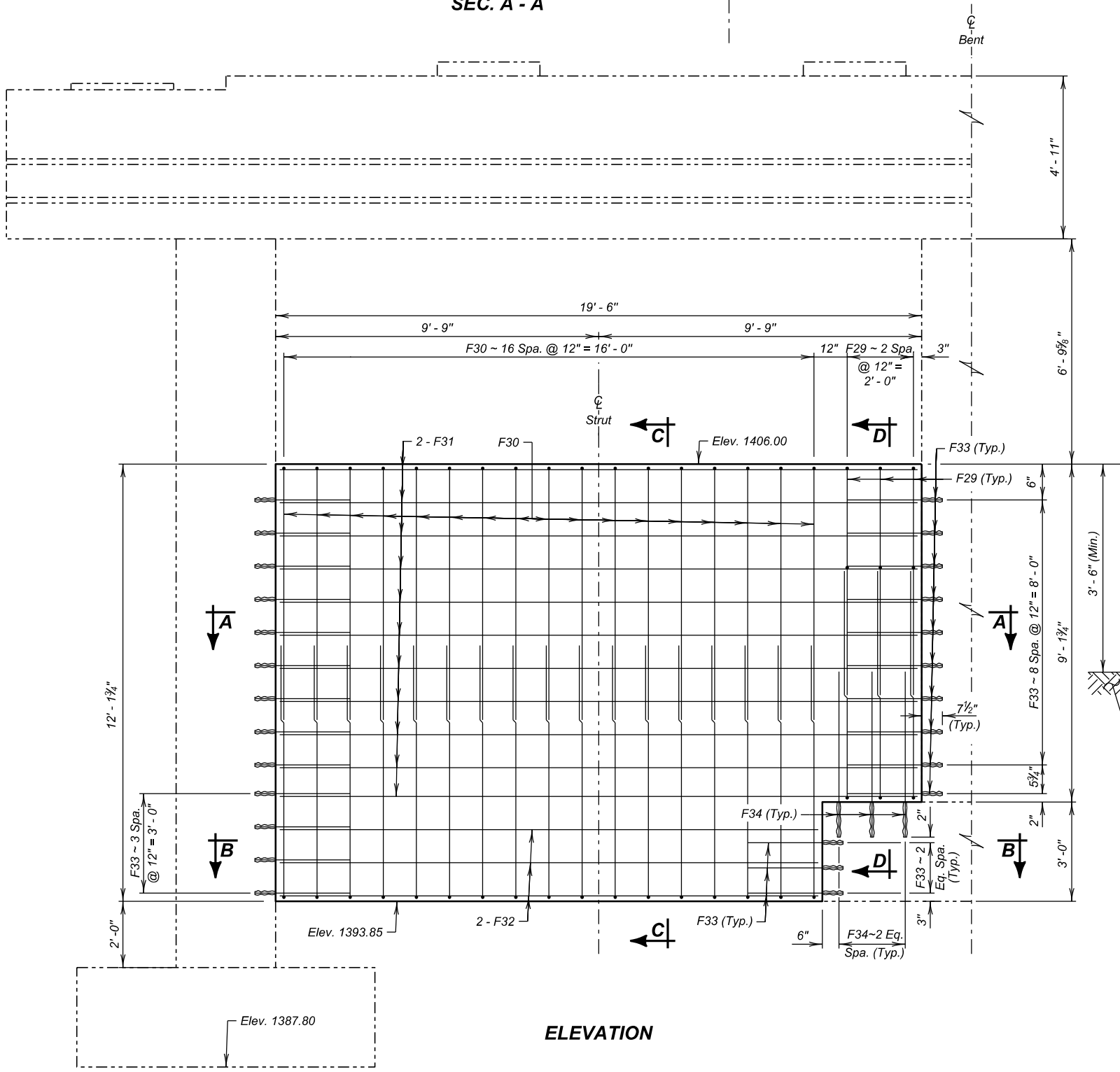
Mk.	No.	Size	Length	Type	Bending Details
F29	6	6	14'-7"	17	
F30	34	6	16'-1"	17	
F31	22	6	19'-2"	Str.	
F32	6	6	16'-2"	Str.	
F33	52	6	2'-11"	Str.	
F34	6	10	5'-0"	Str.	

Δ Does not include the following quantities for bars as these are paid for in the Bid Item "Install Dowel in Concrete".

NOTES:
All dimensions are out to out of bars.

ESTIMATE QUANTITIES
(For One Bent - One Strut)

ITEM	UNIT	QUANTITY
Structure Excavation, Bridge	Cu. Yd.	20
Class A45 Concrete, Bridge	Cu. Yd.	10.6
Install Dowel in Concrete	Each	58
Reinforcing Steel	Lb.	1731



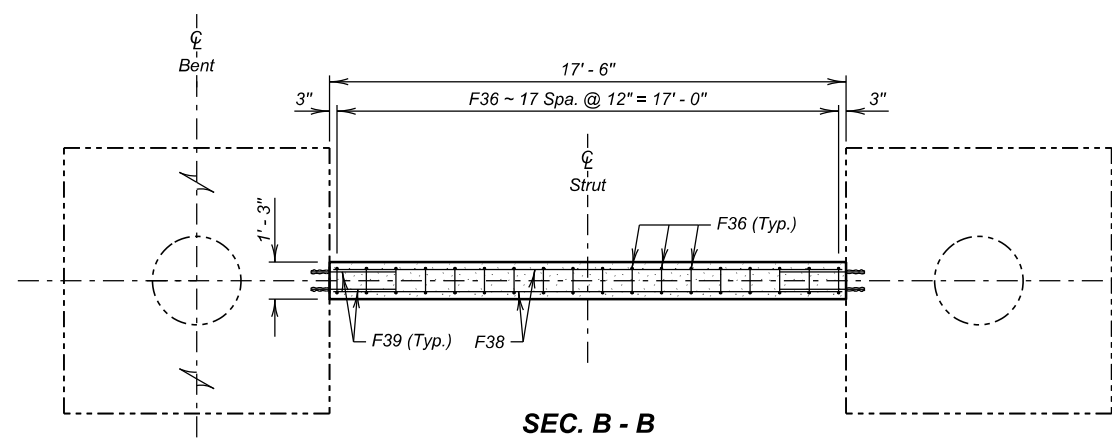
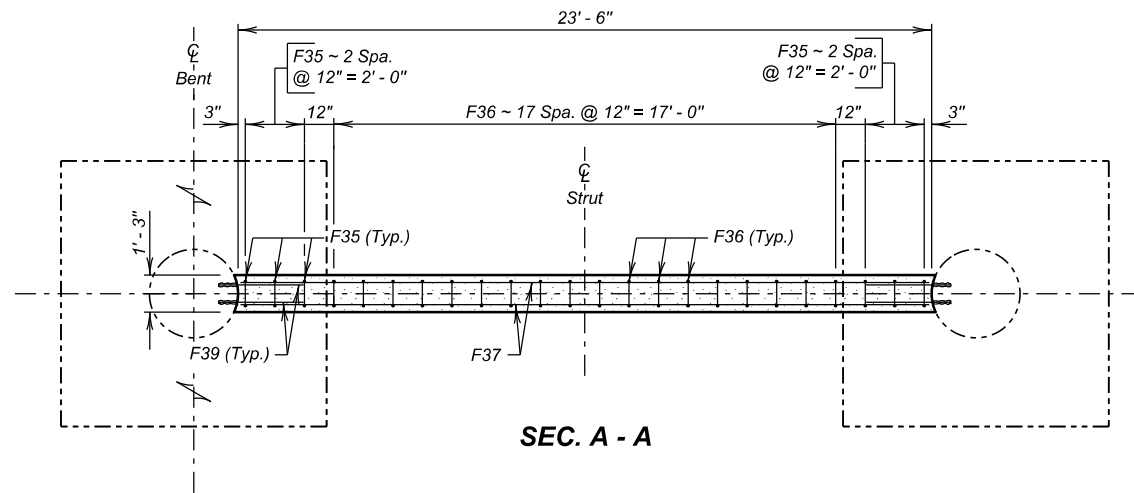
CRASH WALL STRUT (TYPE 'D') BENT NO. 4
FOR
322' - 4 3/4" CONT. COMP. GIRDER BRIDGE
86' - 0" ROADWAY 33° 33' LHF SKEW
OVER I-229 SEC. 22/27-T101N-R49W
STR. NO. 50-216-220 IM-0020(205)

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023

DESIGNED BY K.A.	CK. DES. BY D.S.	DRAFTED BY R.L.	BRIDGE ENGINEER
---------------------	---------------------	--------------------	-----------------

Revised 4-3-2024

STATE OF SOUTH DAKOTA	PROJECT IM-0020(205)	SHEET 94	TOTAL SHEETS 135
-----------------------	-------------------------	-------------	---------------------



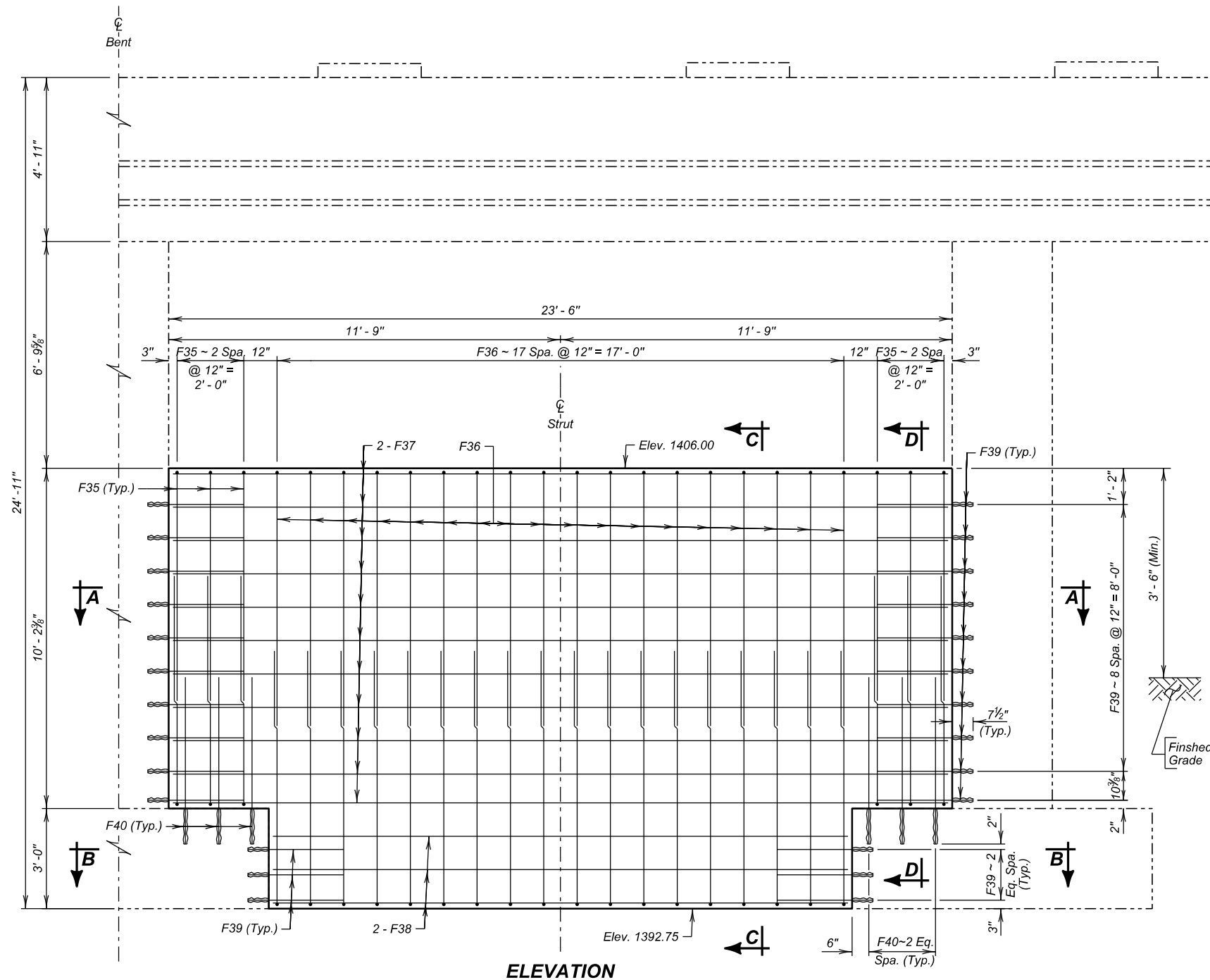
REINFORCING SCHEDULE

(For One Bent - One Strut)

Mk.	No.	Size	Length	Type	Bending Details
F35	12	6	14'-7"	17	
F36	36	6	16'-1"	17	
F37	22	6	23'-2"	Str.	
F38	6	6	17'-2"	Str.	
F39	52	6	2'-11"	Str.	
F40	12	10	5'-0"	Str.	

Δ Does not include the following quantities for bars as these are paid for in the Bid Item "Install Dowel in Concrete".

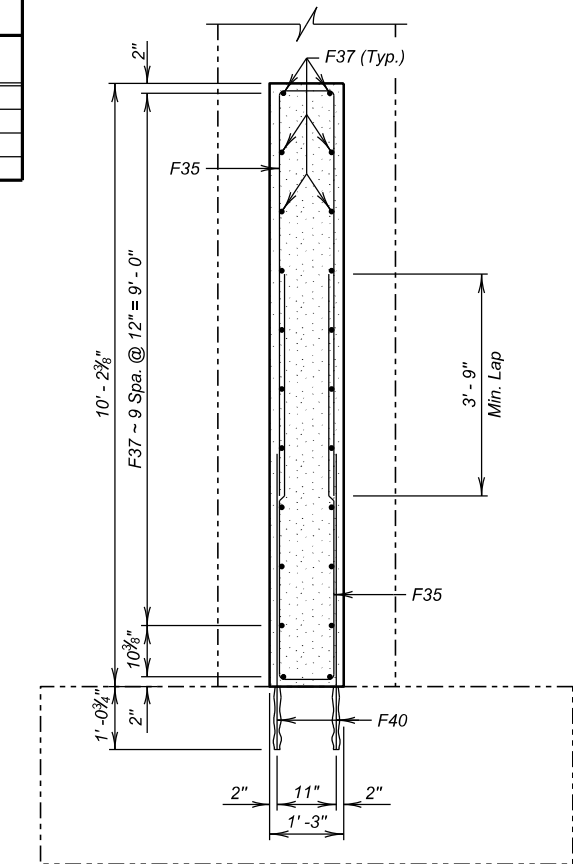
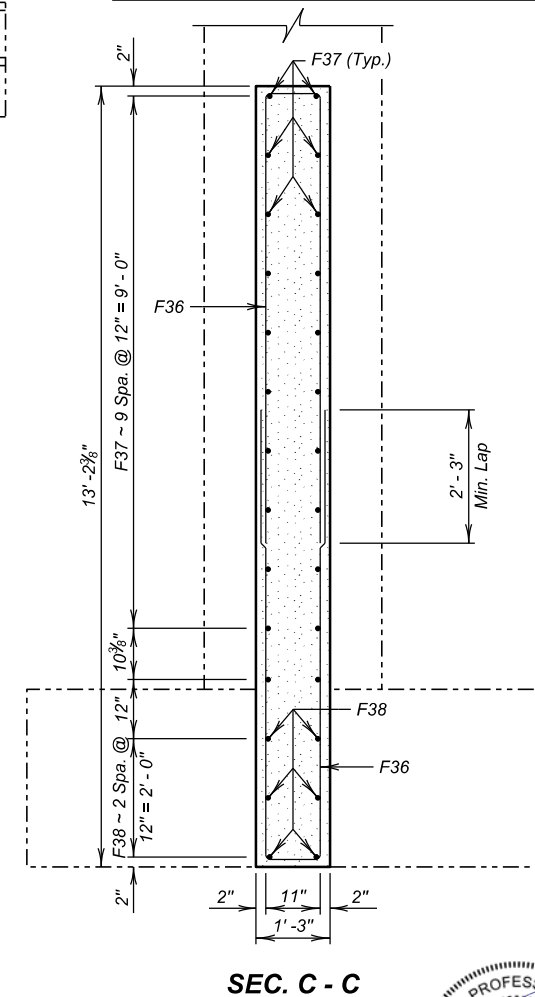
NOTES:
All dimensions are out to out of bars.



ESTIMATE QUANTITIES

(For One Bent - One Strut)

ITEM	UNIT	QUANTITY
Structure Excavation, Bridge	Cu. Yd.	26
Class A45 Concrete, Bridge	Cu. Yd.	13.5
Install Dowel in Concrete	Each	64
Reinforcing Steel	Lb.	2054



CRASH WALL STRUT (TYPE 'E') BENT NO. 4
FOR
322' - 4 3/4" CONT. COMP. GIRDER BRIDGE
86' - 0" ROADWAY 33° 33' LHF SKEW
OVER I-229 SEC. 22/27-T101N-R49W
STR. NO. 50-216-220 IM-0020(205)

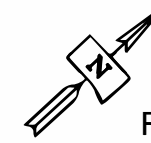


MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
AUGUST 2023

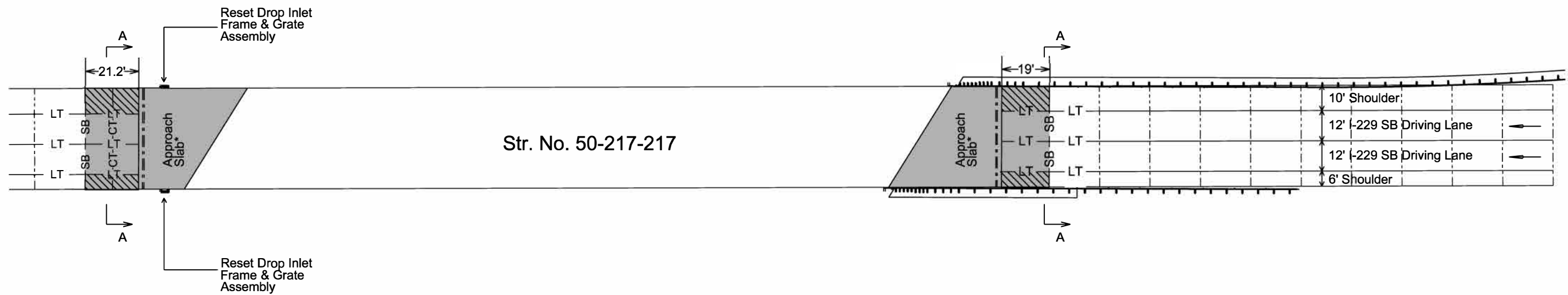
DESIGNED BY K.A.	CK. DES. BY D.S.	DRAFTED BY R.L.	BRIDGE ENGINEER
---------------------	---------------------	--------------------	-----------------

SURFACING DETAILS (PLACEMENT)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM-0020(205)	109	135



Revised 4/3/2024



Item	Quantity	Unit
Reset Drop Inlet Frame & Grate Assembly	2	Each
Membrane Sealant Expansion Joint	80	Ft
10" Nonreinforced PCC Pavement	178	SqYd
Insert Steel Bar in PCC Pavement	72	Each
Dowel Bar	36	Each
Gravel Cushion	33	Ton
High Friction Surface Treatment*	465	SqYd
Abrasive Blasting of PCC Pavement	465	SqYd

* Limits of High Friction Surface

